storm, which was one of the severest ever known on that coast.

A note of considerable interest in connection with this storm is the report that Tillamook Rock Light, 133 feet above the ocean, was extinguished for the first time in its history by the seas that swept over its top during the height of the gale.

Hurricane off the Mexican West Coast.—One severe tropical cyclone occurred this month west of Mexico. Unlike the hurricane of the preceding September, which traversed a long stretch of coastline, this storm apparently originated at some distance from the coast, and moved northward toward the Gulf of California. The northbound British M. S. *El Mirlo* ran into the moderate west gales of the cyclone at 4 p. m. of the 14th, in 14° N., 105° W. With the storm center moving ahead of her, the ship continued in westerly gales for 24 hours, the maximum wind-force being W., 10, at 3 p. m. of the 15th, in 16°04′ N., 106°27′ W. On the morning of the 16th the hurricane center was definitely located near 19°40′ N., 105°50′ W., where the U. S. S. *Dryden*, in a north-northeast hurricane, had a barometer reading of 28.25 inches. Several other ships during the early hours of the 16th encountered hurricane velocities between 19°–20° N., 105°–107° W. The American S. S. *Maine* reported on the unusual suddenness of the onset and ending of the gale. The S. S. *Frank G. Drum*, hove to in the worst of the storm, reported the barometer as pumping violently. All reports indicate that by noon of the 16th gale winds had ceased, as the storm center apparently filled in with extraordinary rapidity.

Typhoons.—In the accompanying article, Typhoons in the Far East, by the Rev. Father Doucette, S. J., of the Manila observatory, five typhoons are indicated as having occurred in the Far East during October. Of these, 3 affected the Philippines; and 2, originating east of the Marianas, moved west-northwest to 20° N., 133°–134° E., then recurved to north and northeast, and passed seaward at some distance east of the Japanese Islands.

It is evident that each of these storms attained great force along some portion of its path. Scattered ship reports show that, in the typhoon of September 29–October 11, the Norwegian M. S. *Skramstad* experienced an east gale of force 11, barometer 29.34, on the 2d, in 19°20′ N., 132°30′ E.

In the typhoon of October 6–12 the Japanese M. S. *Chichibu Maru* reported a north wind of hurricane violence, lowest barometer 28.51, on the 12th, near 35° N., 144° E. This is close to the last day's position of the typhoon center, as given in the Manila report, while the storm actually proceeded much farther to the northeastward on the 13th, according to the Tokyo weather maps.

The typhoon of October 21–28—the fifth mentioned in the subjoined Manila report—early became of hurricane violence, as indicated by the report of the American S. S. *Steel Inventor*, which encountered north and southwest winds of force 12, barometer 29.10 inches, in 18°10′ N., 143°28′ E., on the 22d. This storm also seems to have progressed considerably farther north and east than is noted in Fr. Doucette's table, as a storm report of the 29th, giving a south gale of force 10 near 43° N., 161° E., appears to be definitely associated with this storm in its final stages.

Finally, there is considerable evidence that a sixth typhoon should be added to the list for the month: On the 7th the Norwegian M. S. *Skramstad* encountered a second violent cyclone after leaving the Philippines en route to San Pedro, the earlier being that of the 2d. The second storm was in 28° N., 149½° E., wind southwest 12, lowest pressure 28.8 inches. This locality is several hundred miles northeast of the charted position of the only other typhoon of the date east of the Philippines. Unfortunately, there are no further data available to make certain the later history of this storm, although it may be the same cyclone depicted on the Japanese weather map of October 8, central near 33° N., 145° E.

Miscellaneous gales.—Moderate to fresh northers blew near or in the Gulf of Tehuantepec on the 16th and 18th.

Off the China coast the northeast monsoon was strong on the 3d to 9th, at times attaining fresh gale force in the neighborhood of the Taiwan Channel.

Fog.—Fog was less frequent in October, as a rule, than in the preceding month. Along the American coast it occurred on 4 days off Lower California; on 11 days off California; and on 3 days off the coast northward to Vancouver. Scattered fogs occurred in northern waters of the Pacific, being most frequent over the area lying between 30°–45° N., 160°–175° E., where it was reported on 8 days.

North Pacific aviation.—The flight of Sir Charles Kingsford-Smith from Australia to California in his plane, *Lady Southern Cross*, occurred partly in October. After his arrival at Suva, Fiji, on the 20th, he was delayed until the 28th in leaving for Honolulu, owing to unfavorable weather. On that date he left Suva and without material difficulty arrived at Honolulu about 24 hours later. On November 3 he left Honolulu, and arrived at Oakland, Calif., 15 hours later (Nov. 4). A few hundred miles from the California coast he encountered fog, but succeeded in locating his position, as he stated it, "by sighting the tops of the hills sticking out of the fog."

This is the first Australia-to-California flight.

THUNDERSTORMS AT SEA

The American S. S. *Point Caleta*, G. Hagsberg, master while in 16°20′ N., 99°58′ W., en route northward along the Mexican coast, passed through an electrical storm of "remarkable violence", during the night of October 2–3, 1934, according to a report furnished by the observer, Second Officer James R. Pace. Blinding flashes of lighting repeatedly struck the ship, causing the antenna to fall across the bridge. The fore and main topmasts were shattered, and the main truck was carried away. "Stays carried away the electric charge, and with the exception of when the antenna fell, there was little evidence of St. Elmo's fire."

On the early morning of October 4, in 18°31′ N., 104°15′ W., the S. S. *Point Caleta* passed through another "electrical disturbance of greater brilliancy than the previous night's storm. It began with squalls of wind and rain at 2 a. m. and ended at 3:10 a. m." Lightning this time did not strike the ship, but was striking at varying distances about it.

The barometer was steady on both occasions, and the wind was mostly light and variable.—W. E. H.

TYPHOONS IN THE FAR EAST, OCTOBER 1934

BERNARD F. DOUCETTE, S. J.

[Manila Observatory]

Five typhoons affected the weather of the Far East during October 1934. Three of these typhoons formed between Guam and Palau, moved northwest, crossed the Philippines and the China Sea, and entered Indo-China and China. The other two formed east of the northern Ladrone Islands, moved northwest or west-northwest, then recurved to the northeast and moved past Japan.

The approximate positions of these typhoons as they appeared on the 6 a. m. weather maps are given below.

Typhoon, Sept. 29 to Oct. 11

	Latitude (° N.)	Longitude (° E.)
Sept. 29	10	146
Sept. 30	12. 30	142. 30
Oct. 1	14	140
Oct. 2	17. 40	134. 30
Oct. 3	18	128. 20
Oct. 4	18	122
Oct. 5	18	118
Oct. 6	18	115
Oct. 7	18	114
Oct. 8	18	112
Oct. 9	18	111
Oct. 10	20	111
Oct. 11	22	112

This typhoon crossed northern Luzon October 4. Barometric minima reported are as follows: Tuguegararo, 733.60 mm (28.882 in.); Aparri, 740.03 mm (29.135 in.); Vigan, 740.32 mm (29.147 in.); Laoag, 739.80 mm (29.126 in.). Considerable loss of property was reported, but the destruction caused by this typhoon must be considered in conjunction with the effects of the previous typhoon that passed over almost the same path. It is to be noted that these two typhoons were very similar, both in their courses, velocity of travel, and intensity. The loss of life was reported, on October 9, to have been 39, most of these casualties being due to drowning.

Typhoon, Oct. 6 to 12

	Latitude (° N.)	Longitude (° E.)
Oct. 6	19	149
Oct. 7	18	140
Oct. 8	20	133
Oct. 9	20	133
Oct. 10	23	132
Oct. 11	27	136
Oct. 12	33	143

These locations of the center were found with the help of observations sent to the observatory by the captains of S. S. *Iowa*, S. S. *Michigan*, and S. S. *Steel Scientist*. This typhoon was of large area, intense, and moving slowly in the region of recurvature.

Typhoon, Oct. 13 to 19

	Latitude (° N.)	Longitude (° E.)
Oct. 13, 2 p. m	7	137
Oct. 14, 6 a. m	8. 30	134. 30
Oct. 15, 6 a. m	13	126. 30
Oct. 16, 6 a. m	15	120. 30
Oct. 17, 6 a. m	16	116
Oct. 18, 6 a. m	16	113
Oct. 19, 6 a. m	17	109

This typhoon was of small extent, moving very rapidly. It passed close to and north of Manila, October 16, 4 to 7 a. m.; 740 mm (29.134 in.) was the barometric minimum recorded at the observatory. The highest wind velocity recorded (1 minute average) was 57 m.p.h. on a 3-cup Robinson anemometer. At Infanta, Tayabas Province (about 40 miles east-northeast of Manila) the barometric minimum reported was 729.36 mm (28.715 in.), with gales of force 12. The eye of the storm passed over Infanta, an experience which the city of Manila did not have. The path of destruction was narrow. The property loss, consisting of crops ruined by inundation, roads and buildings destroyed, is estimated to have been about 9,000,000 pesos. This, with the report that 68 lives were lost, was published in the newspapers October 20.

The position of the observatory as the typhoon passed was a short distance south of the vortex. The writer, interested in the existence or nonexistence of fronts near the center of a typhoon, did not observe any discontinuity which could be called a front, as the typhoon passed.

Typhoon, Oct. 17 to 25

	Latitude (° N.)	Longitude (° E.)
Oct. 17	9	140
Oct. 18	10. 30	135
Oct. 19	13	128
Oct. 20	13. 30	123. 30
Oct. 21	14	119
Oct. 22	16	114
Oct. 23	16	111
Oct. 24	16. 30	108
Oct. 25	17	106

This typhoon passed south of Manila, October 20. It passed over Naga, Camarines Sur, and close to Batangas, Batangas Province. At Naga the barometric minimum was 738.01 mm (29.055 in.), with winds of force 9; at Batangas, 740.47 mm (29.153 in.), with winds of force 7, were recorded. The destruction was that due to heavy rains, namely loss of crops and animals, together with the ruin of light-material buildings. There were 22 lives lost. On October 25, in Indo-China, this typhoon caused the death of over 250 people, together with considerable property loss, including crops, buildings, and animals, according to the report in an Associated Press dispatch.

Typhoon Oct. 21 to 28

	Latitude (° N.)	Longitude (° E.)
Oct. 21	16	150 (2 p. m.)
Oct. 22	16. 30	147
Oct. 23	18	141
Oct. 24	19. 30	135
Oct. 25	20	134
Oct. 26	26	136
Oct. 27	28	139
Oct. 28	35	148

This typhoon was located with the help of observations from the S. S. *Steel Inventor* and the S. S. *Larry Doheny*, sent to the observatory, October 22 and 23. On the morning of the 24th, the S. S. *Larry Doheny* sent out a distress signal, the ship being almost helpless because of damage suffered in the typhoon. Because of the rapid movement of the typhoon, the destructive winds did not last long, and the ship was able to proceed to Guam under its own power, accompanied by the U. S. S. *Gold Star*.

In conclusion, the writer wishes to call attention to the 4 typhoons, 1 late in September, and the 3 in October, which crossed the Philippines. The first two were very similar in their courses and intensity. The third and fourth were similar, and moved along a course parallel to that of the first two, but displaced to the south. A satisfactory explanation of this regularity cannot be given until a more thorough study of these situations has been made. All that can be said now is that the anticyclones which formed over China during October were very important factors in the courses of these typhoons.